



CEC Environmental Performance Water-Related Issues and Findings

Dick Anderson
Environmental Office
California Energy Commission
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1996 BASELINE AND FUTURE PROJECTED CONDITIONS

- Population increase to 47.5 million people by 2020 (34 million in 2000).
- Groundwater supplies are a limited and over-drafted resource in many parts of California.
- 4.4 million AFY loss from the Colorado River increases the problem.
- Future “average year” fresh water shortages are expected in all but a few regions.
- The availability of fresh water can be a major constraint for new projects.



Water Resources

- Clean water is an increasingly valuable resource in California.
- Fresh water conservation is goal.
- There is a potential for energy facilities to affect:
 - Fresh water supply and quality of surface and groundwaters.
 - Marine, bay and estuarine ecosystems.



Key Water Use Goals for New Power Plants

Comparison of Typical Water Use Levels for Cooling Technologies for a 500 MW Combined Cycle Combustion Turbine Power Plant

Cooling Process	Consumptive or Non-Consumptive	Gallons per MWh	Acre-feet per year
Once-through	Non-consumptive	40,000	250,000
Wet Cooling Towers	Consumptive	250	4,000
Dry Cooling	Consumptive	50	230

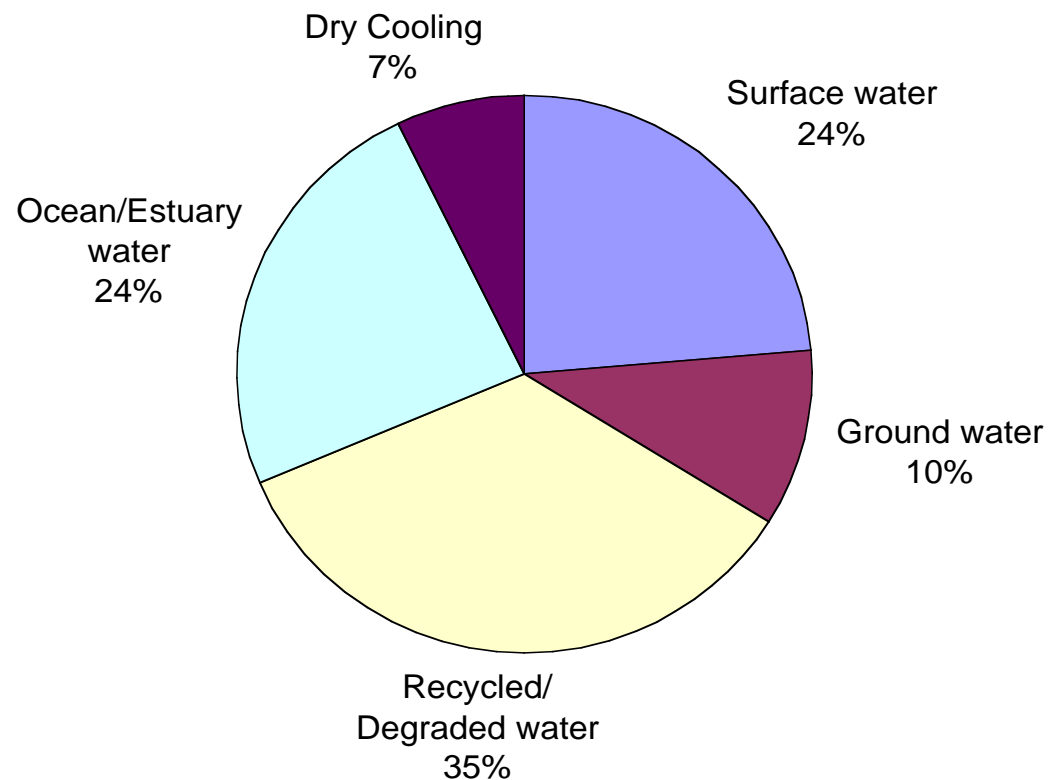
- Commission adopted “no freshwater for cooling” policy
- Reduction in fresh surface water and groundwater use for power plant cooling.
- Increase in cooling with degraded and recycled water, and use of alternative technologies such as dry cooling.

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Cooling Medium for the 4,516 Megawatts That Came Online from 1996-2002

**Proposed cooling medium for the megawatts currently under
construction or review**



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Summary of Findings: Water Supply

- Competition for fresh water increasing.
- Some years contractual obligations to supply not met.
- Power plant use can cause significant impacts locally.
- Total use is small at aggregate state level.
- Since 1996, siting of new power plants in areas with limited fresh water supplies has increased.
- Using degraded surface and groundwater is preferred.
- Power generation water use data is not easily obtained which hampers our ability to report on trends.



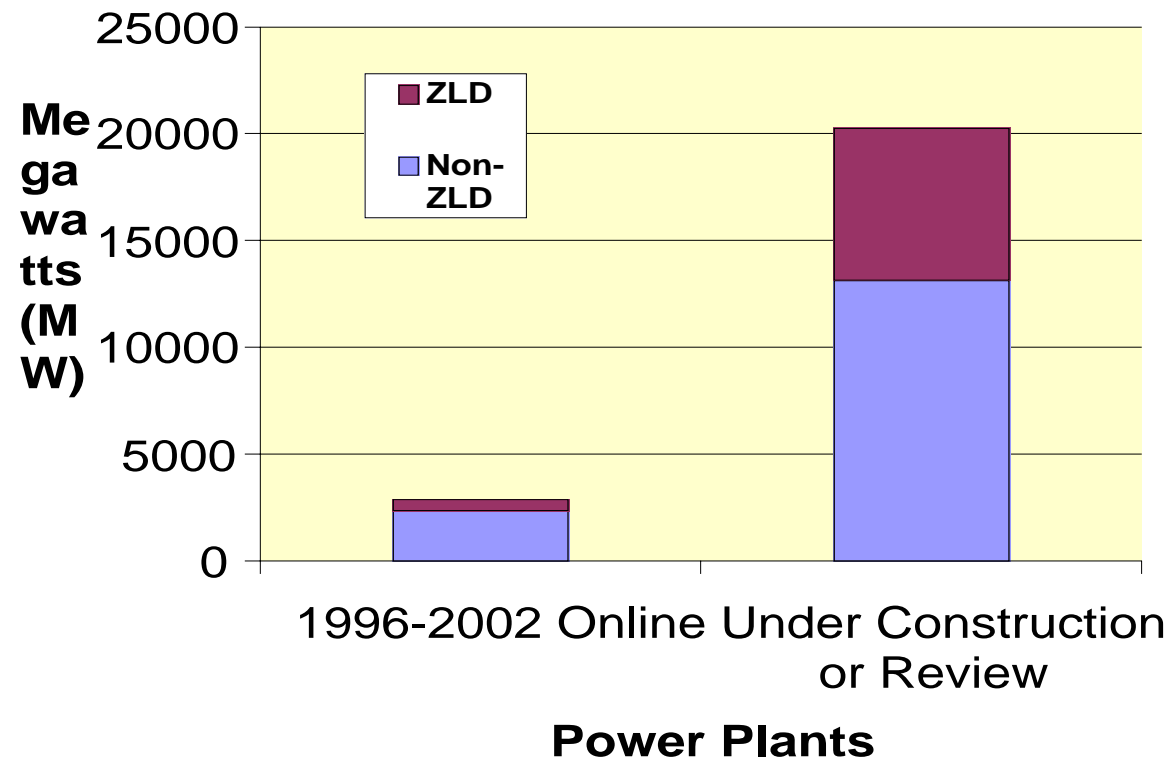
Summary of Findings: Water Quality

- Commission adopted “ Use ZLD” policy unless environmentally undesirable or economically unsound.
- Wastewater discharge is being reduced by using ZLD.
- Of 4,516 MW new capacity brought online between 1996 and 2002, only 12 percent use ZLD, but more than 35 percent currently in licensing review or under construction will use this technology.
- Once-through cooling at existing and repowered plants perpetuates water quality impacts to aquatic resources.
- Where hydroelectric facilities operate they can cause significant water quality alterations.



- Assess and mitigate long-term impacts to aquatic ecosystems in marine, bay and estuarine environments.

ZLD use in recent power plant siting





Key Water Resource Goals for 2005

- Staff continues to track the use of water conserving cooling alternatives and recycled water.
- Staff continues to track the reduction in liquid wastewater discharged to land, groundwater and surface waters by power plants and the increase in the use of zero liquid discharge technology.